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Perspective

Cholera in Haiti: The Equity Agenda and the Future of Tropical Medicine

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A centennial is a good time to reflect on history, and history reveals just how much progress has been made in the heterogeneous field of tropical medicine in the past one hundred years. However, the picture might look different if we start from the point of view of the Haitian poor. From that perspective, the rubric “tropical medicine,” coined to refer to a host of pathologies, has less to do with latitude than with persistent poverty.

“The white man’s grave,” one of the tropics’ sorry monikers, is a case in point: this expression rose to prominence during the waves of European ventures into Africa, Asia, and Latin America. Haiti fits into such a framework because of its history, rather than its geographical coordinates. When Napoleon’s brother-in-law, General Charles Leclerc, set sail to reclaim rebellious Haiti for the French, he headed the largest armada ever to cross the Atlantic. But Haiti was not to be retaken. Leclerc’s troops encountered not only a slave uprising but also yellow fever, malaria, and other “tropical” scourges, as had Christopher Columbus, who helped establish the first European settlement in the New World on the northern coast of the island more than two centuries before. (Of course, the lethality of the Columbian exchange went primarily in the other direction.)

The colonial experience remains the template for modern tropical medicine. It’s a long way from colonial (and neocolonial) medicine to international health, to say nothing of “global health”—the newest iteration of tropical medicine, and the best. However, it is a trajectory well worth understanding. The Panama Canal was one of the midwives of international health: the tens of thousands of workers who perished to yellow fever and malaria and other afflictions led to the establishment of the Pan-American Sanitation Bureau in 1902.¹ After a dozen or so such commissions on “sanitation and hygiene” came the effort to eradicate hookworm in 1909, funded by John D. Rockefeller and his foundation, which is also celebrating its centennial this year.^{2,3} Most public health initiatives in the early twentieth century focused on the application of lessons learned and of new tools—effective and ineffective—such as vaccines and other preventative measures (ranging from improved hygiene to vector control), to the pressing health problems of the day.

New frontiers in tropical medicine required not only new preventatives, but also new diagnostics and therapeutics. The middle of the twentieth century was a time of rising expectations, in part because of the development of effective antibacterials and antiparasitics, linked to modern microbiology.⁴ Some of these new drugs and vaccines were nothing less than “magic bullets,” saving lives that would previously have been beyond recall.^{5–7} Mid-century yaws, polio, measles, rubella, and pertussis control campaigns showcased the faith generated

by such new tools. The pride—some would say hubris—accompanying these developments was only strengthened by the eradication of smallpox in 1977.⁸

But pride and hubris are not the same thing. If medicine is, to use Lewis Thomas’s felicitous expression, “the youngest science,” then how might we apply the fruits of basic science to the neglected diseases of poverty?^{9,10}

It’s not merely polemic to note that all diseases that affect primarily the poor are, by definition, neglected. Cholera offers an object lesson: one hundred fifty years after John Snow took the handle off the Broad Street pump, more than a century after his suspicions of bacterial origin were confirmed, 60 years after antibiotic therapy was discovered, and 30 years after a safe and effective oral vaccine was developed, cholera remains—among the world’s poorest—a leading infectious killer.

How could this be? How, in the 21st century, does a scourge against which we have a full arsenal of preventatives and therapeutics continue to fell hundreds of thousands of people every year? Four decades after we had every tool needed to wipe cholera off the face of the earth, it has prospered, and, in the least water-secure country in the Americas, exploded like a bomb. The cholera epidemic in Haiti, an island nation of ten million, is the world’s largest in recent history: in its first year, cholera claimed some 6,500 lives and caused half a million cases.¹¹ (And these are official numbers, which are almost certainly too low because there is little reporting capacity in rural areas, where the disease struck first and hardest.)

If we know so much about cholera, its pathophysiology and epidemiology and treatment and prevention, how did it become the leading infectious killer of young adults in Haiti during the international humanitarian response—one of the largest in history—to the January 2010 earthquake? The short answer is that expectations are lowered for diseases that disproportionately afflict poor people. Investment in long-term public-sector water and sanitation systems have stalled or failed to keep up with demand. Safe, effective, and affordable oral vaccines exist, and yet remain unavailable in Haiti—as do, too often, timely diagnosis and care. When some suggested integrating vaccination into the response,¹² public health officials were quick to note that vaccination was not cost-effective (as if “cost” were fixed in stone and “effectiveness” well understood). Some dismissed the idea as a “trial,” as if the vaccine had not been tested. (It had, in fact, been tested and proven effective in large trials in India, Vietnam, Bangladesh, Mozambique, and elsewhere.¹³) Others wrote off the feasibility of vaccination during the chaos of a post-earthquake epidemic. But Haiti’s best resource is arguably its network of community health workers who were rapidly mobilized to disseminate information and distribute millions of water purification tablets in the first month of the epidemic. Robust public-sector water and sanitation systems must be designed and constructed, and are without a doubt the ultimate bulwark against

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cholera and other waterborne diseases. However, they take time to build, and are not acceptable as the sole emergency response plan.

This is the dilemma of global health in the 21st century: finally, we have the tools for prevention and diagnosis and care; *what we lack is an equity plan linked to a delivery system*. Future historians of tropical medicine may regard the first decade of the century (and the millennium) as the golden age of global health. From the time of the eradication of smallpox in 1977 to the end of the century, there were too few global health successes. But the establishment of the Bill & Melinda Gates Foundation, which invested in discovery and development, and the President's Emergency Plan for AIDS Relief and the Global Fund to Fight AIDS, Tuberculosis, and Malaria, which invested in delivery, offers a blueprint for global health equity. The development of a veritable delivery science should be the chief objective of tropical medicine.

Whether we look at cholera or lymphatic filariasis or malaria or any other "neglected tropical disease," the roadmap for the future of tropical medicine and hygiene—two 19th century constructs—is the same: scientific discovery linked to product development and, most importantly, to an equitable delivery strategy. Only a comprehensive and integrated approach will sustain and broaden the achievements of the golden age of global health.

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